AMENDMENTS TO THE CLAIMS

52. (Original) A method for debugging a program in real time and while said program is executed by a programmable logic controller, said method comprising the steps of:

displaying a section of said program indicated by a user to be debugged;

saving original compiled code of said program;

compiling said section of said program to be debugged in another section of memory;

jumping to said another section of said memory during execution of said program when an instruction indicated to be debugged is to be executed; and

capturing a status of said instruction as it is executed, wherein said program is debugged in real time and while said program is executed by said programmable logic controller.

53. (Original) The method according to claim 52, further comprising the step of returning to said original compiled code of said program after said instruction indicated to be debugged is executed.

54. (Previously Presented) The method according to claim 53, further comprising the step of restoring said original compiled code once said status is captured.

55. (Original) The method according to claim 52, further comprising the step of instrumenting each instruction compiled in said another section of memory.

56. (Previously Presented) The method according to claim 52, further comprising the

step of storing a table relating instructions to boolean expressions, wherein said instructions are debugged with said boolean expressions.

57. (Previously Presented) The method according to claim 52, further comprising the step of providing a table of pointers to instructions of said original compiled code, wherein said instructions are located in memory during debugging.

58. (Previously Presented) The method according to claim 52, further comprising the step of limiting a data size of each compiled instruction, wherein execution of said instructions to be debugged is faster and memory required to store said instructions is reduced.

59. (Previously Presented) An apparatus that debugs a program in real time and while said program is executed by a programmable logic controller, said apparatus comprising:

an area of memory for saving original compiled code of said program;

another area of memory for storing a compiled section of said program to be debugged;

a branch that causes execution of said program to jump from said original compiled code to said another section of said memory during execution of said program when an instruction indicated to be debugged is to be executed; and

a circuit for capturing a status of said instruction as it is executed, wherein said program is debugged in real time and while said program is executed by said programmable logic controller.

60. (Currently Amended) The apparatus according to claim 59, further comprising a display for displaying said ~~instructions~~ instruction to be debugged.

61. (Previously Presented) The apparatus according to claim 60, further comprising a table relating instructions to boolean expressions, wherein said instructions are debugged relatively faster with said boolean expressions.

62. (Previously Presented) The apparatus according to claim 59, further comprising a table of pointers to instructions of said original compiled code, wherein said instructions are located in memory during debugging.